

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated June 15, 2007. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1-24 and 27-45 stand for consideration in this application, wherein claims 1 and 12 are being amended to correct formal errors and to more particularly point out and distinctly claim the subject invention. All amendments to the application are fully supported therein, as further explained hereinbelow. Applicant hereby submits that no new matter is being introduced into the application through the submission of this response.

Claim Rejection Under § 103(a)

Claims 1, 6-9, 12, 17-20, and 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,459,679 to Ziporovich ("Ziporovich") in view of U.S. Patent No. 6,359,744 to Mallary ("Mallary").

The cited prior art, alone or in combination, does not teach or suggest the present invention. Specifically, with respect to the signal processing limitations, the Examiner relies on Ziporovich as follows: "Ziporovich teaches how the PRML channel cancels the Offset of the signal. It is obvious that because the DC offset is found at frequency value 0, when the DC offset is eliminated, the low frequencies are also diminished or eliminated when eliminating the DC offset (col. 8)." See Office Action at 2 (emphasis added). That is, Ziporovich is characterized in that the PRML channel cancel diminishes or eliminates the signal offset. The PRML channel makes the signal offset (DC offset or low frequency component) zero. This description is shown in many parts in the Ziporovich patent, for example, in the first three lines of the Abstract.

The claimed feature of the present invention (Claims 1 and 12) includes "a reproduced signal outputted from said reproducing head is processed through a partial response equalization circuit having a frequency characteristic such that a low-frequency component of said reproduced signal including a direct current (DC) component is passed and suppressed through said partial response equalization circuit." See Claims 1 and 12 (emphasis added).

In order to more fully clarify this distinction, in the present amendment, these claim limitations (see Claims 1 and 12) have been amended to now require that “a low-frequency component of said reproduced signal including a direct current component is partially suppressed but not completely cut off through said partial response equalization circuit. The use of “suppress” in the initial version of the claims was meant to denote this same meaning, but the Examiner (citing the 5th definition from a general purpose dictionary – which is by itself counter to Federal Circuit teachings) argued that the term “suppress” encompasses “eliminate.” Rather than argue the point further, Applicants have instead made the above-referenced amendment in order to make Applicants’ meaning perfectly clear.

In short, Ziporovich shows the structure for canceling the DC component (offset) and making it zero. Claims 1 and 12 of the present invention (as amended) show the structure for passing and partially suppressing the DC component. This distinction means the DC component is attenuated and appropriately controlled – not made zero as in Ziporovich. This is a significant distinction.

This difference is also supported throughout the specification of the present application as follows:

the curve 21 in FIG. 4;
page 14, lines 11-16;
page 15, line 28 through page 16, line 2; and
page 4, lines 2-7.

The equalizer 13 forms a signal having the signal spectrum as shown in curve 21 of FIG. 4. The curve 21 shows that the DC component is partially passed. Accordingly, the presently claimed invention is not taught or suggested by Ziporovich’s handling of the DC component.

More generally, the present invention is also distinct from Ziporovich in its fundamental focus or target. Specifically, one important feature of Claims 1 and 12 of the present invention is in the partial response equalization circuit but not in the PRML channel. The partial response equalization circuit corresponds to FIR filter 36 in FIG. 1 of Ziporovich. The equalizer (partial response equalization circuit) 13 of the present invention is the subsequent stage of the A/D converter 12 as shown in FIG. 1. The equalizer 13 of the present invention is a FIR filter (transversal filter) as shown in FIG. 9. However, in Ziporovich, the element for handling the DC signal component corresponds to the feedback loop of the digital

offset control 42, the offset DAC 34 and the summing junction 24 of FIG. 1. It is not the FIR filter 36.

Further, the present invention performs the processing on the digital signal output from the A/D converter 12 as shown in FIG. 1. Ziporovich, on the other hand, performs the DC offset removal process on the analog signal before input to the A/D converter 26 at the summing junction 24. Accordingly, the present invention is also different from Ziporovich in the element handling (i.e., "processing") the DC component.

Finally, the end effect of the present invention is substantially different than Ziporovich. In the perpendicular magnetic recording system, the main signal component is the DC component. In the present invention (Claims 1 and 12), the DC component is not cancelled but is instead suppressed in order to effectively transmit the signals to the detector. This system improves the error rate of the detector. Such signal processing is particularly effective in the perpendicular magnetic recording system. Ziporovich does not (and cannot) teach or suggest such an effect.

The other listed prior art (Mallory, Hull and Kikuta) does not address any of the above-described limitations of Ziporovich. These references are irrelevant in this regard, and are merely cumulative to Ziporovich. Accordingly, the present invention (Claims 1 and 12 and all claims depending therefrom) are distinguishable as set forth above.

Allowable Subject Matter

Applicants would like to thank the Examiner for the careful consideration given this case, for the indication that Claims 27-42 are allowed, and for the indication of allowable subject matter in Claims 2-5 and 13-15. In view of the above amendments and remarks, Applicants believe that all outstanding issues have been addressed and prompt allowance of all remaining claims is respectfully requested.

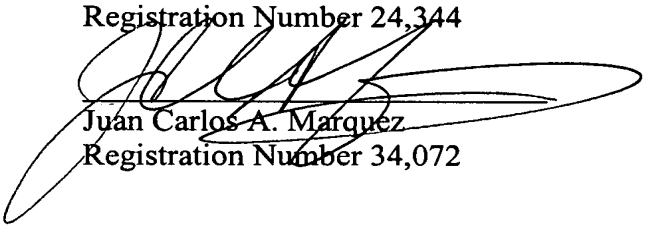
Conclusion

In view of all the above, Applicant respectfully submits that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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June 15, 2007
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